I. REMARKS/ARGUMENTS

A. General

The application still contains 43 claims. The claims have not been amended since the previous response.

Claim 2 remains cancelled.

B. Acknowledgement of Allowance

The Applicant gratefully acknowledges the allowance of claims 17, 22-30 and 44, as indicated by the Examiner on page 24 of the Office Action.

C. Double Patenting

On page 3 of the Office Action, the Examiner has rejected claims 1 and 44 under the judicially created doctrine of obviousness-type double patenting, alleging that the subject matter of claims 1 and 44 does not distinguish patentably over claims 1 and 27 of U.S. Patent No. 6,990,096.

On page 4 of the Office Action, the Examiner has similarly rejected claims 1 and 3-44 under the judicially created doctrine of obviousness-type double patenting, alleging that the subject matter of claims 1 and 3-44 does not distinguish patentably over claims 1-47 of Copending Application Publication No. U.S. 2002-0181452. The Applicant respectfully remarks that according to the USPTO public PAIR system this Publication number corresponds to the aforementioned U.S. Patent No. 6,990,096.

In order to overcome this rejection, the Applicant submits herewith an appropriate terminal disclaimer under 37 C.F.R. 1.321(c).

D. Summary of First Rejection under 35 USC §103(a) and Response

On page 11 of the Office Action, the Examiner has rejected claims 1, 3-8, 11-16, 18-21 and 31-43 under 35 USC §103(a) as being unpatentable over U.S. Patent No 6,731,631 (hereafter referred to as Chang) in view of U.S. Patent 6,907,042 (hereafter referred to as Oguchi).

The Applicant respectfully traverses this rejection and submits that independent claim 1, as it currently stands, is not rendered obvious by the cited prior art, as discussed below.

The Applicant believes in the validity of the arguments presented in the November 8, 2006 response to the Office Action dated June 26, 2006, but nevertheless submits herein below additional arguments against the rejection of claims 1, 3-8, 11-16, 18-21 and 31-43 under 35 USC §103(a).

To begin with, one will appreciate that Chang discloses a Gigabit Ethernet switch featuring a switching table within its switch fabric that can be updated via status messages between switch fabric components, without the need for handshaking between components.

On page 12 of the Office Action, the Examiner concedes that Chang does not teach the claimed control entity of the cells of the switch fabric. However, the Examiner alleges that Oguchi discloses this limitation and that it would have been obvious to one of ordinary skill in the art to combine the Chang and Oguchi references.

However, it is the Applicant's respectful submission that:

A) A person of ordinary skill in the art and facing the problems of Chang would not turn to Oguchi for a solution because Oguchi's method relates to a completely different field of endeavour.

B) Even in a hypothetical combination of Chang and Oguchi, the resulting system would be completely different from the present invention and would fail to provide solutions for the problem solved by the claimed invention.

Arguments Regarding Point A: Oguchi does not deal with switching tables in a switch fabric chipset, with switch fabrics, or with packet routing through a network switch, and thus fails to offer any viable solutions for problems faced by Chang.

Instead, Oguchi is concerned only with packets having arrived at their destination, not packets to be switched/routed. Oguchi discloses a TCP/IP network device that is an initiation/termination point for layer 4 packets (col. 1, lines 53-61; fig. 18). Oguchi describes a method for dealing with packets received by the network device *that are destined to the device itself* and are not to be switched/routed (fig. 5, step S13; fig. 9, step S45; col. 10, lines 58-67 *inter alia*). In Oguchi, a layer 3 component assembles small packets together and sends them up to a layer 4 component (the OS of the network device) as a combined packet. The purpose of this is to reduce the number of discrete packets being processed at layer 4 (TCP layer) and thus save time spent by OS overhead for each packet. Instead of interrupting the layer 4 OS for every packet received at layer 3, they are assembled into bigger packets in the layer 3 component and sent up to a receiving buffer in the layer 4 component. The big packet thus assembled requires a single instance of OS packet-receiving overhead to convey all the smaller packets it contains to the OS (layer 4), where they will be processed thus terminating their course through a network.

The switching/routing of packets through a switch is not touched upon in any detail in Oguchi, as it is not the concern of the Oguchi invention. The Examiner's attention is respectfully directed to figure 5 which is a flow chart describing the method disclosed by Oguchi. In step S13 a decision is made as

to whether a received packet is destined to Oguchi's device itself. If so, the flow chart continues to step S15 and the following operations are further described. If, however, a received packet is *not* destined for Oguchi's device, thus requiring switching/routing through a switch such as that provided by Chang, the rest of the operation is merely described as a single step, S14, "*transfer process as ordinary IP packet*" (col. 10, lines 48-67; see also fig. 9, step S46 and col. 13, lines 60-61). It is clear that Oguchi does not describe, in any detail, the switching/routing functions that would require the use of a switch fabric. And it is thus clear from the foregoing that Oguchi *cannot* be related to either a switch fabric or to data routing thorough a switch since it does not deal with packets requiring further routing. Oguchi is effectively devoid of any teachings on switching methods and packet routing as well as of any details on a switch fabric or switch fabric chipset.

Furthermore, it is noted that the presence of a switch for packet routing through a network is not even required in Oguchi but is optional. Indeed, switching or redirecting of packets from a network interface to another network interface, as takes place in a switch via a switching fabric, is barely touched upon by Oguchi. Oguchi pertains to switches only insofar as the method he describes can be used with a switch to treat packets that are destined *for the switch itself* and not intended for routing by the switch. Although the network device of Oguchi is generally described throughout as comprising a layer 3 switch (L3 switch), it is clear throughout the text that the presence of *the L3 switch is not a necessary part* of Oguchi's network device (col. 8, lines 35-39, *inter alia*). So while Oguchi is used in a preferred embodiment in a router having a layer 3 switch, it must be understood that the presence of a network switch at all is purely optional and that even in an embodiment of Oguchi containing such a switch, the invention still only relates to packets not requiring further switching/routing.

Oguchi contemplates the use of his method in a device that includes a switch (which presumably includes a switching fabric) yet does not apply his method

to the switching portion of the device. Quite simply, this is because Oguchi's method cannot be applied as such. Figures 10, 18, 19 and 20 are the only illustrations of embodiments with defined switching elements (see col. 14, lines 16-36). In these embodiments, a layer 3 switch is included in the system, and performs traditional switching of packets that require routing while Oguchi's invention is applied to packets destined for the illustrated device. Thus where Oguchi has considered the application of his invention (featuring a component that keeps track of the level of free space available in the layer 4 buffer (Fig. 1, item 102) and conveys that information to a level 3 component for determining how many packets can be combined and sent to the layer 4 buffer) to a setting that includes a switch, he does not apply his method to switching elements. This is because, as has already been mentioned in this response, Oguchi's method is not intended for use in packet switching/routing, cannot be adapted therefor and concerns an entirely different problem then packet switching: the problem of receiving packets at an OS layer.

Moreover, Oguchi provides a system that is incompatible with 1-to-many communication. In Oguchi, an IP layer (layer 3) accumulator buffer accumulates IP packets until their sum reaches a size suitable for the free space in an OS layer buffer. Once this is achieved, the IP layer interrupts the OS with a combined packet. Clearly this kind of architecture is only suitable for a 1-to-1 relationship since the IP layer accumulator must be receiving and combining only packets that are destined to the OS (and there is no need to provide for a 1-to-many relationship, as there is only one OS layer). If, however, Chang features cells that are in connection *with every other cell of an array*, as alleged by the Examiner on page 13 of the Office Action, the 1-to-1 relationship of sender/receiver in Oguchi makes the Oguchi solution inapplicable to Chang.

It is thus respectfully submitted that a person of ordinary skill in the art, faced with the teachings of Chang which is concerned with the effective transfer of data from a switch fabric entry point to a switch fabric exit point, would not

turn to technology related to high-layer data processing or cross-layer packet-passing for a solution. Buffering is used in all sorts of applications ranging from layer 4 functions, to application-layer (or software) functions, to microprocessor architecture, and even to non-electronic arts such as railway management. Each application has its own problems requiring special solutions. In the case of a layer 4 function, presented in Oguchi, the problem is that an excessive rate of receipt of packets leads to too many OS interrupts and too much interrupt overhead. A technician of ordinary skill would no more be motivated to turn to such applications for solutions to routing-related or switch fabric-related problems than to any other buffer applications in the fields listed above, which are completely unrelated to intra-switch fabric connectivity. It is thus respectfully submitted that combining Chang with Oguchi would not have been occurred to a person of ordinary skill in the art, due to Oguchi being so far removed from the field Chang's field of endeavour.

For all the foregoing reasons, it should be apparent that Oguchi is of no interest to a reader of Chang and therefore that it is not plausible to suggest that Oguchi may be combined with Chang.

Arguments Regarding Point B: Notwithstanding the above, the Applicant respectfully submits that even if one were to **hypothetically** combine the teachings of Chang with those of Oguchi, the resulting system would be completely different from the present claimed invention and would completely fail to provide the advantages and solutions afforded by the present invention.

Specifically, Chang discloses a network switch whose switch fabric features a switching table that can be updated via status messages between switch fabric components. Chang is not significantly concerned with the specifics of dealing with packets destined to the switch itself. On the other hand, Oguchi discloses a network device, that may be a switch, that deals with the burden of excessively frequent OS interrupts by packets destined to it, by combining those packets together and interrupting the OS only when many of them have

arrived and are ready. If Oguchi's network device is a switch and receives a packet not destined to it, it merely performs a "*transfer process as ordinary IP packet*" (fig. 5, item S14 –*see also:* col. 10, lines 58-67; fig. 9, item S46; col. 13, lines 60-61). Oguchi is not significantly concerned with the specifics of switching/routing packets that are not destined to the switch itself.

With Chang dealing with the specifics of switching a packet to be routed across the switch and Oguchi dealing with processing packets destined to the switch itself, it is clear that a hypothetical hybrid of the teachings of Chang and Oguchi would lead to a system where packets to be forwarded are dealt with in accordance with the teachings of Chang and packets to be sent to the OS are dealt with in accordance with the teachings of Oguchi. In other words, the hypothetical combination of Chang and Oguchi would provide a system that features a switch as provided by Chang and buffered cross-layer packet-passing for packets destined to the switch itself, as provided by Oguchi. This is completely different from the system envisaged by the Applicant and fails to render the present invention obvious.

It is thus the Applicant's respectful submission that there is simply not plausible to contend that combining the teachings of Chang and Oguchi[1] will provide a system bearing a switch fabric on a chip comprising a plurality of cells, each cell including the control entity claimed in present claim 1, or anything similar enough thereto to render present claim 1 obvious.

Summary:

For all the reasons presented above in the discussion pertaining the Chang reference and to the Oguchi reference, the Applicant respectfully submits that the claimed invention is not obvious over the cited prior art. Accordingly, the Examiner is respectfully requested to withdraw the rejection of claim 1 under 35 USC §103(a).

Claims 3-8, 11-16, 18-21 and 31-43 depend directly or indirectly on independent claim 1 and therefore incorporate by reference all of the limitations of independent claim 1. Accordingly, for the same reasons as presented above with respect to independent claim 1, claims 3-8, 11-16, 18-21 and 31-43 are believed to be new and non-obvious over the cited prior art.

E. Summary of Second Rejection under 35 USC §103(a) and Response

On page 22 of the Office Action, the Examiner has rejected claims 9 and 10 under 35 USC §103(a) as being unpatentable over Chang and Oguchi as applied to claims 1-8, 18-21 and 31-43 and further in view of U.S. Patent No. 6,741,552 (hereafter referred to as McCrosky). In view of the foregoing discussion regarding claim 1, the Applicant respectfully submits that claims 9 and 10 are in allowable form as set forth herein below.

Specifically, it has already been demonstrated in this response that Chang and Oguchi fail to render obvious the invention claimed in present claim 1. It has been extensively demonstrated that the feature of "*a control entity to control release of a data packet toward a selected destination cell from among the plurality of other cells of said array at least in part on a basis of a degree of occupancy of the memory in said destination cell*" is new and non-obvious in light of the Chang and Oguchi references. In addition this feature is also missing from McCrosky which merely discloses a binary hypercube structure.

In short, it should be apparent that the cited prior art references, whether taken alone or in combination, neither disclose nor render obvious the subject matter of claims 9 and 10. The Applicant therefore respectfully requests the withdrawal of the rejection of claims 9 and 10 under 35 USC §103(a).

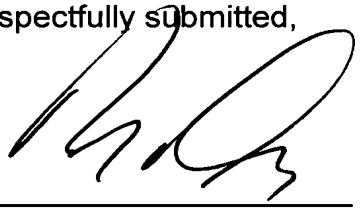
[1] In a purely hypothetical scenario, recalling that such a combination would not occur to one of ordinary skill in the art

II. CONCLUSION

In view of the above, it is respectfully submitted that claims 1 and 3-44 are in condition for allowance. Reconsideration of the rejections is requested. Allowance of claims 1 and 3-44 at an early date is solicited.

If the claims of the application are not considered to be in full condition for allowance, for any reason, the Applicant respectfully requests the constructive assistance and suggestions of the Examiner in drafting acceptable claims so that the application can be placed in allowable condition as soon as possible and without the need for further proceedings.

Respectfully submitted,



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